



Inc. 1910

Public Works

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AGENDA

Driggs WWTP – Ammonia Removal Options
235 South 5th Street, Driggs ID
8/23/2019 10:00am

The purpose of this meeting is to identify and assess potential technologies to bring the WWTP into compliance for ammonia.

Compliance Goal: Average Monthly Limit=0.84, Max Daily Limit=1.68
Typical Influent: Varies between 12-35 (depending on the time of year)

Technology Requirements:

1. Achieve the compliance goals, year-round.
2. Must be operational by April 1, 2020
3. Sized for our current summer peak daily flows (1.3 MGD+/-)

Additional Criteria/ Decision Making Factors:

1. Capital Costs
2. Operation Costs
 - a. Manpower
 - b. Electricity/propane
 - c. Other
3. Expandability
4. Start-up/Shut down time
5. Permitting
6. Additional constituent removal benefits
7. Effect on WWTP classification level (currently a high 2)
8. Other criteria...

Technologies:

1. Purammon
2. Ozone
3. Break-point chlorination
4. Quick Wash – Renewable Nutrients
5. Other proven tech?
6. Other tech?

Meeting Summary
Driggs WWTP – Ammonia Removal Options
235 South 5th Street, Driggs ID
8/23/2019 10:00am-12:30pm

Attendees: Jay Mazalewski (City of Driggs), Jared Gunderson (City of Driggs), Willie Teuscher (DEQ), Greg Eager (DEQ), Scott Rogers (Aqua Engineering), Dave Noel (Forsgren Associates), Kevin Harris (Forsgren Associates), Jason Broome (Forsgren Associates)

Meeting Summary:

Jay M. gave brief summary of the meeting goals, reviewed the agenda and reiterated that the group would be focused on finding a technology that would bring the plant into compliance by April of 2020 and not attempting to troubleshoot the plant operations.

Willie T. suggested that the “permitting” criteria be changed to “approval” as DEQ will need to approve the technology, not permit it.

Dave N. suggested that timing be added to the criteria.

Dave N. discussed rapid rate oxidation options; break point chlorination vs ozonation. The group agreed that both types of oxidation should work and should meet all the identified criteria.

Ozonation will have a higher capital cost and operational cost due to electrical usage, it may also eliminate need for the UV as it acts as a disinfectant. The process can be turned off/on as needed if the biological plant failed. Dave N. thought a wall mount unit should suffice. The estimated capital cost was between \$100K-\$400K. Willie T. stated that a minimum 1-month pilot will be needed along with backup documentation showing this technology is used successfully elsewhere. The group determined this is a viable option.

Break point chlorination will have a lower capital cost and maybe a lower operational cost, it may also eliminate need for the UV as it acts as a disinfectant. De-chlorination will be required. Jared G. was concerned about the operational/operator safety and potential permit violation with the use of chlorine. On-site chlorine generation, liquid chlorine, and gas chlorine options were discussed. Jay M. expressed concern regarding the effectiveness/amount of chlorine needed for the cold water (5C). No estimated capital costs were discussed. Willie T stated that a minimum 1-month pilot will be needed along with backup documentation showing this technology is used successfully elsewhere. The pilot could be modified to simulate cold water events. The group determined this is a viable option.

Scott R. discussed Quick Wash Renewable Nutrients, also known as gas permeable membrane. This technology will recover the ammonia into a usable product (fertilizer). Based on our loadings the amount of product produced will be minimal. This is newer technology and typically used for high ammonia loading (industrial). Willie T. stated this will need a longer pilot time (3-months) in order for DEQ to approve. Costs were estimated to be in \$2-\$4 million range. The group determined this may be viable option, but not preferred due to cost and timing.

Ammonia stripping towers were discussed, but determined not to be viable due to low air/water temperatures.

Scott R. discussed MicroVi Technology, a targeted biological system that can remove ammonia. Jay M. expressed concerns regarding temperature and toxicity compatibility. This is newer technology and typically used for high ammonia loadings (industrial). Willie T. stated this will need a longer pilot time (3-months) in order for DEQ to approve. No capital costs were estimated. The group determined this was not a viable option.

Scott R. discussed Ferric chloride and electric coagulation; however, these were determined to be operation changes to the plant and not relevant to this meeting.

Jay M. discussed Purammon's Ion Exchange technology. The technology was piloted in the Driggs lab (3 day) in 2017 and was successful. Scott R. expressed concerns regarding capital costs, licensing costs and flow equalization (Scott estimated \$1.5 Million vs \$900K). This is newer technology and just being piloted in Milwaukee. Willie T. stated this will need a longer pilot time (3-months) in order for DEQ to approve. The group determined this may be viable option, but not preferred due to cost and timing.

Jay M. discussed High Desert H₂O (Ted Seaton) technology. Ted has run multiple tests/samples of the Driggs effluent but has yet to meet compliance levels. The technology/process is unknown. No capital costs or operation costs are known. Willie T. stated this will need a longer pilot time (3-months) in order for DEQ to approve. The group determined this was not a viable option as there is not enough information available.

Dave N. discussed relocating the treatment plant discharge location to the Teton River. This solution will increase the mixing zone, thereby increasing discharge limits. All agreed this is a good solution, especially for the long term. Jay M. discussed potential political and public opposition. Early engagement was identified to be critical for this solution. Discharge routing will follow Bates Road to the river. Jay M. inquired what the estimated ammonia discharge limits will be, Willie T. guessed between 4-8 mg/l. The group determined this is a long-term solution to pursue based on the City's growth, but will not ensure compliance, therefore is a not a viable solution at this time.

Dave N./Scott R. discussed using the Huntsman Golf Course ponds as a re-use or relocated discharge location. More information is needed to address this option including; discharge location, pond leakage, irrigation usage, and owner approval. The group determined this is a long-term solution to pursue but will not ensure compliance, therefore is a not a viable solution at this time.

Willie T. inquired about redundancy for any system installed. Jay M. requested that the chosen system be considered the redundant system as the biological plant should be the primary mechanism to remove ammonia.

Conclusions:

Forsgren will include the options discussed in the facility plan update. A copy of the meeting summary will be sent to all parties, EPA, and included with the next DMR. Jay M. will meet with the Mayor and Jared G. on Wednesday to discuss the next step.

The group reviewed all the options and concurred that the rapid rate oxidation process was the best option to pursue. The group debated merits and drawbacks of each type:

Break point chlorination:

- Pro: lower capital cost
- Pro: lower operational cost
- Con: Operator safety with chlorine
- Con: Potential for permit violation if de-chlorination is not calibrated
- Con: Additional staffing/monitoring

Ozonation:

- Pro: Ease of automation
- Pro: No additional chemicals needed
- Pro: No need to remove/treat the effluent after ozonation
- Con: Higher capital cost
- Con: Higher operational cost (electrical)

8/29/2019 City Update:

On 8/28/2019 The City of Driggs directed Aqua Engineering, via Scott R. to:

Please put together a conceptual proposal/plan for installing break-point-chlorination at the Driggs WWTP to meet our ammonia discharge limits. Attached is the past two years of in-house testing data that show flows, influent ammonia levels. pH, temperature, etc. The plan/proposal should include:

1. *Conceptual layout*
2. *Capital cost, including installation, equipment, automation, new structures, etc.*
3. *Annual operating cost, forecasted over 5-years. Please include any required chemicals (chlorine, pH adjusters, dichlorination, etc), power consumption, and additional anticipated manpower hours.*
4. *Installation of a pilot plant to run for 30 day, including the ability to adjust influent temperature to mimic winter conditions.*

I will need this by 12pm, Monday September 16.

On 8/28/2019 The City of Driggs directed Forsgren Associates, via Kevin H./Dave N. to:

Please put together a conceptual proposal/plan for installing ozonation at the Driggs WWTP to meet our ammonia discharge limits. Attached is the past two years of in-house testing data that show flows, influent ammonia levels. pH, temperature, etc. The plan/proposal should include:

1. *Conceptual layout*
2. *Capital cost, including installation, equipment, automation, new structures, etc.*

3. *Annual operating cost, forecasted over 5-years. Please include any required chemicals (pH adjusters, etc), power consumption, and additional anticipated manpower hours.*
4. *Installation of a pilot plant to run for 30 day, including the ability to adjust influent temperature to mimic winter conditions.*

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